

Performance of Conformable Phenolic Impregnated Carbon Ablator in Aerothermal Environments

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Conformable Phenolic Impregnated Carbon Ablator, a cousin of Phenolic Impregnated Carbon Ablator (PICA), was developed at NASA Ames Research Center as a lightweight thermal protection system under the Fundamental Aeronautics Program. PICA is made using a brittle carbon substrate, which has a very low strain to failure. Conformable PICA is made using a flexible carbon substrate, a felt in this case. The flexible felt significantly increases the strain to failure of the ablator. PICA is limited by its thermal mechanical properties. Future NASA missions will require heatshields that are more fracture resistant than PICA and, as a result, NASA Ames is working to improve PICA's performance by developing conformable PICA to meet these needs. Research efforts include tailoring the chemistry of conformable PICA with varying amounts of additives to enhance mechanical properties and testing them in aerothermal environments. This poster shows the performance of conformable PICA variants in arc jets tests. Some mechanical and thermal properties will also be presented.